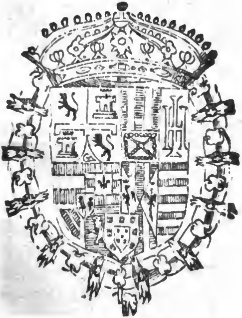
IO. BAPTISTAE PORTAE NEAP.

ELEMENTORVM CVRVILINEORVM.

Libri Duo :-



SVPERIORVM PERMISSV.

NEAPOLI,
Apud Antonium Pacem. MDCI.

AD LECTOREM
PRAEFATIO.

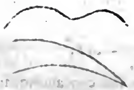
SEMPER me quidem magna cępit admiratio, candide lector, quod cùm triplex sit mathematica, rectilinea, curuilinea, & quæ rectilineas in curuilineas, & è contra transmutaret: de prima maximi vndequaque viri descripserunt, de secunda, & tertia ne verbum quidem, & maxima demũ sum affectus miratione, quòd cùm multi viri docti de circuli quadratura tractare conati fuerint, vel mathematicas physicis rationibus, vel prodigiosis probare enixi sunt. Ipse quidem, qui potius noua tractare, quàm ab aliis transcribere natus, Euclidis propositiones multas in curuilineas cõuerti, & cùm nihil fecisse cognouerim, ex multis, & infinitis propemodum demonstrationibus, quas inueni, has elegi, ne me morte præuento perirent. Fortasse doctioribus meliora inueniendi an-

iam præbebo; aleam iecisse fortasse præstabit. Si vita prorogabitur, multarum figurarum curuilinearum quadrationes ostendam; interea his fruere: si grata fecisse cognouero, meliora libenter impertiam.

IO· BAPTISTAE PORTAE
NEAPOLITANI.
ELEMENTORVM
CVRVILINEORVM.
Liber Primus.

DEFINITIONES.

1



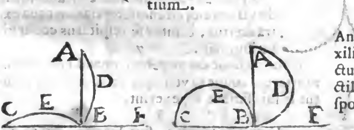
LINEA curua est, quæ inter sua non æque fluit puncta, sed facto sinu flectitur.

2

Angulus flexilineus est flexarum linearum retusio, suo nutu sibi coincidentium.

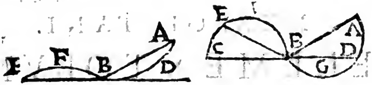
3

Angulus flexilineus rectus, qui rectilineo respondet.



Exempli causa sit A B *insidens linea, iacens* F B C, *vtrobiq; sibi æquales constituens angulos* A B F, A B C, *sitq;* A B *ipsi* B C *æqualis, & ipsi* A B *hemicyclium circumscribatur* A D B, *vel circuli por-*

tio, & ipsi B C, alter B E C, vel æqualis circuli portio. Cyclogoni ergo D B A, C B E sunt æquales, & quanto angulus A D B F minor est recto ipso cōtingentiæ angulo D B F, tanto A B E superat ipsum A B C, altero contingentiæ angulo A B E, totus igitur A D B E C, toti A B C recto æqualis, vt probauit Proclus in Euclidem. lib. 3. Pet. 4.

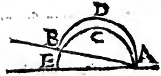


4

Obtusus curuilineus, qui obtuso rectilineo, fitq; quando à recto resupinata, in maiorem angulum abit.

Eodemq; modo angulum A D B F E flexilineum rectilineo A B E esse æquale, flexilineus angulus F B E est æqualis flexilineo D B G: nam æquales sunt circulorum portiones, si angulum D B G abstuleris, & reposueris supra E B, erit rectilineus D B E æqualis flexilineo D G B F E.

5



Sic etiam semicirculus A D B, æqualis est C A C E, dematur portio communis A D B C remanet angulus D A C æqualis rectilineo B C A E.

6

Xystroides angulus, siue concauus, quando vtrarumq; circumferentiarum caua extra fuerint, & intus se respiciens conuexitatibus suis.

7

Contra conuexus angulus, quando circumferentiarum conuexa vtrinque extra fuerint, & intus se suis finibus aspexerint.

8

Angulus μηνοειδής, siue lunaris, qui ex caua, conuexáque circumferentia fuerit, vt conuexum vnius alterius conuexitatem respiciat.

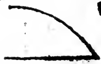
Cys-

9

Cyſſoides angulus, ex hederæ foliis nomen indeptum, ex gibboſis, cauiſq; lineis conſtat, ad punctum vnum conuenientibus, vndatim contra ſe diſcurrentibus, veluti vndulatus.

10

Mixtus angulus, qui ex rectis circuloſiſq; lineis componitur.

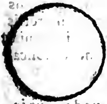


11

Cyclogonius qui à caua, & recta circuli circumferentia conſtat.

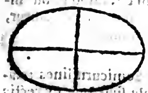
12

Κερατοειδὴς, ſiue in cornua falcatus, quando rectæ opponitur conuexa, *noſtri contingentiæ vocant*.



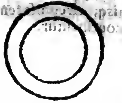
13

Figura, vel angulosa, vel agonia, agoniarum figurarum circulus princeps, lineæ partem, quæ ambitioſè circumuoluitur, & aream ob ambit, concauum dicimus, quæ extrorſum inuehitur, conuexum.



14

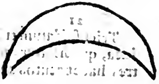
Sphærois, ſiue ellipſis ex ambienti linea in ſe recurſa deſcribitur, vnius duæ diametri, longitudinis vna longior, latitudinis altera ad rectum in medio ſe ſecantes.



15

Vertex, ſiue corona eſt duorum circulorum concentricorum circumcurſus.

16



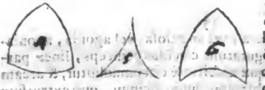
Anguloſarum figurarum meniſcus, ſiue lunula prior, eſtq; in

easdem partes caua habentibus compræhensa circumferentiis figura.

17

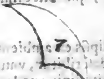
Trilaterarum figurarum flexilinearum æquilaterum flexilineum triangulum primum est, quod tribus constat iisdem æqualibus circumferentiis circuli, idque conuexum, concauum, vel mixtum.

18



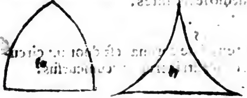
Isoscele triangulum ciruilineũ, quod duobus tantum æqualibus circuli circumferẽtiis continetur, idq; enim conuexum, vel concauum, vel mixtum.

19



Scalenum flexilineum est, quod tribus inæqualibus circuli circumferentiis clauditur, iisq; cauis, conuexis, & mixtis.

20



Semicuruilinea triãgula sunt, quæ ex rectis curuisq; circumferentiis continentur.

21

Tricuspidatum triangulum, siue acioidea, quadrilaterum est triãgulum, quod tres habet acutos angulos.

Inter

22

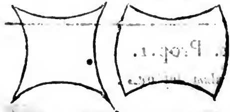
Inter triangulares figuras πελεκοειδὴς figura est, quæ securis, vel bipennis formam habet.

Eius Theocritus meminit. Nicandris scholiastes sutorium scalprum. τὰ κυκλοτερῆ σιδήρια, οἷς οἱ σκυτοτόμοι τέμνουσι καὶ ξύουσι τὰ δέρματα. idest, circularia ferramenta, quibus pelles incidunt, & deradũt.

23

Arbilones ex tribus circumferentiis comprehẽsi. *Horum meminit Pappus: spatum illud inter circumferentias interiectum* ἄρβηλον *vocans.*

24

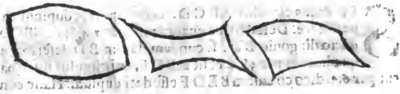


Quadrilaterarũ quidem figurarum curuilinearum, quadratum quidem flexilineũ est, quod rectis angulis, æqualibusq; circumferentiis perhibetur.

25

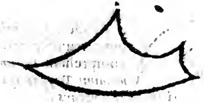
Rhombus flexilinea, æquilatera quidem, sed non rectangula, aduersos tamen angulos æquales habet, eorumque aliquos concauos, conuexos, & mixtos.

26



Rhombeides verò neutrum horum habet, neq; laterum, neque angulorum æqualitatem, ſed contrarias circumferentias; & angulos æquales habet, ſimiliter etiam concauus, conuexus, & mixtus. 27

Trapezium curuilineum, qui quatuor inæqualibus circumferentiis, ſed lateribus parallelis conſtat.

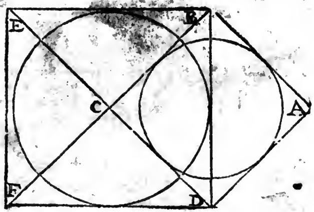


28

Trapezoides curuilineũ, quod quatuor inæqualia latera ex diuerſis circumferentiis habet.

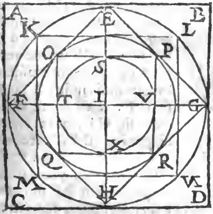
Prob. 1. Prop. 1.

Datum circulum duplare.



SIT datus circulus A B C D, cuius oportet duplum inueſtigare. Deſcribatur quadratum per 7.4. & ſit ABCD, ducto diagonio B D. ſecundum datam B D deſcribatur quadratum per 48.1. & ſit B E D F, cui circulus inſcribatur per 6.4. dico circulum B E D F eſſe dati duplum. Hanc conſtru-

ſtructionẽ demonſtratione fulciendã rati ſumus. Quoniã B C D rectus eſt angulus, proinde cũ quadrata lateris BC, CD, æqua-quadrato ex BD, eo quia BC, CD ſunt æqualia, ergo quadratũ BD, duplum quadrati A B C D, ſed ex B D deſcriptum quadratum eſt D B F E, ergo quadratum B D F E duplũ ipſius ABCD. Sed circulus ad circulum eandem rationem habet, quam quadratum inſcriptum, aut circ umſcriptũ, vt ex Euclidea demonſtratione ratum eſt, duodecimo elementorum ſecunda. Ergo circulum A B C D duplauimus per circulum B E F D. Vel quia dimidium quadrati B D C eſt quarta pars quadrati, B E F ex 34. primi, ergo quadratum B E D F duplum eſt A B C D, & hoc eſt Platonis inuentum, vt Vitruuius etiam annotat.

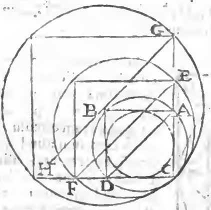


Poſſumus, & alio modo circulos duplicare, ſi circa datum circulũ quadratum induxeris, & poſt circa quadratum circulũ, & circa circulum aliud quadratũ, eodem modo alios circulos ſemper duplicabis. Sed quo iuuenes rectius imaginari, & capere poſsint, exemplo diximus declarandum.

Eſto datus circulus S T VX, quem oportet condu plicare, huic quadratũ circũſtruemus OPQR, cuius latera duabus diametris, ſe ad centrum I decuſſantibus bipartiantur, & circa quadratum O P Q R circulus alter deſignetur, mox aliud quadratum K L M N, & alter circulus, ac demum aliud quadratum A B C D, quod poſtremum circulum K L M N intercludat. His perſtructis aio aream inter circuli K L M N finitionem concluſam, proximè ſepientis laxioris ſui circuli O P Q R duplam eſſe, vt ipſe mox ipſius K M L N, qui introrſum cingit, etiam duplum, vt laxior poſtremi area, qui minimum intercludit, quadrupla ſit. Et ſic in infinitum duplare poſſumus: cuius veritas hac demonſtratione repræſentabitur.

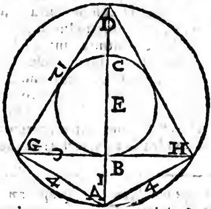
Quo-

Quoniam linea A B bifariam diuisa est in E, quadratū A B C D quadruplum est ipsius A E, & sic in quatuor quadrata æqualia A I, E G, F H, I D, & hæc à quatuor diagoniis bifariam diuisa sunt, E F, F H, H G, G E. quatuor igitur triangula extrinseca F A E, E B G, G D H, H C F, quatuor interioribus æqualia sunt, ergo totum quadratum A B C D, quadrati E F H G duplum erit, eademq; ratione quadratum E F H G, ipsius O P Q R duplum erit, & primum A B C D huius quadruplum.

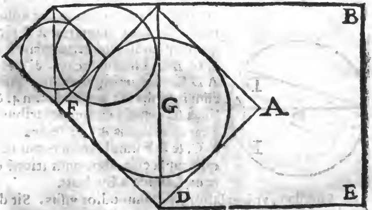


Annitemur etiā per quadrata dupla ambientia idē rimari, & absoluere. Esto datus circulus A B C D, cui quadratum A B C D. circūstruimus: mox ab oppositis angulis ducto diagonio A D & à puncto C superne versus A signa lineam eiusdem longitudinis ipsius A D, & fit C E, & ex parte inferiori fit C F, mox trahe diagonium E F, & iterum & iterum quanta E F figura in linea C G, & infernè linea C H, & id toties repetendum quoad satis videbitur. Sic quadratum ex G H, duplum est quadrati E F, & quadratum E F duplum A D, & A D duplum A C. Sed quod exprimit figura, demōstremus. Quoniam quadratum A D est æquale quadratis A C, C D, & A C, C D latera æqualia sunt, ergo quadratum ex A D, duplum est quadrati A C, sed A D est æquale E C, ergo quadratū E C est duplum A C. Sed quia E F est æquale duobus quadratis E C, C F, & E C, C F æqualia sunt, ergo quadratum ex E F duplum est E C. Eodem modo G H, duplum ipsius A C. Et si idem variis modis assequi posset, tanquam suffecturos reliquos censuimus missos facere.

Libet



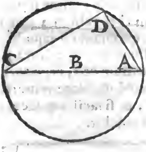
Libet non prætermittere alium quadruplādi modū. Sit circulus CB, quē intendimus quadruplare, circa quem æquilaterum triangulum, per secundam tertii describamus, & circa illud aliū circulum, per quintam eiusdem, quem quadruplum pronunciamus. Quoniā D G est tripla ipsius G A, ex 12. 13. Si quadratum DG erit duodecim partium, talium G A erit 4. & quadratum G B erit talium 3: nam quadratum G D quadruplū est G B, suæ dimidiæ: sed quadratum A G est æquale quadratis G B, B A, igitur si quadratum G A erit talium 4, & quadratum G B, talium 3, erit quadratum B A talium 1. Sed A E erit 4, quoniam est æqualis AG, & quando quadratum totū 4 est, & sui pars 1. erit linea p medium diuisa, ergo A B ipsius A E dimidium erit, ergo tota AD ipsius E B quadrupla est. Si verò circulū diuidere voluerimus, poterimus conuersa vti operatione, & si facilia quidem sint, quo tyrones iuuemus, apponere non pigebit.



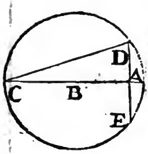
Describe quadratum tantæ quantitatis, quantæ duplarem

circulum dimidendum fieri cupis, & sit A B C D, cuius medio fige punctum A, super quo ambitiosa linea circumducatur, quę omnia quadrati tangat latera, deinde annectæ lineas rectas à centro ad angulos duos A C, CD, & constitue triangulũ A C D, & aliud priori par triangulum constitue, cuius angulus F erit rectus, est igitur A C D F secundum quadratum primi dimidium. In medio puncto huius diagonii C D, qui sit G, pone pedem circini, & reliquo vago describe circumferentiã tangentem sui latera quadrati A C D F, & hoc modo in infinitum poteris circulos dimidiare. Demonstratio ex superiori pendet.

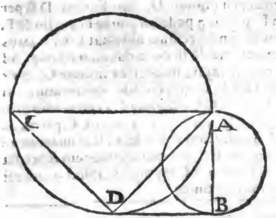
Datum circulum triplicem, quintuplicem, & septuplicem reddere. Probl. 2.



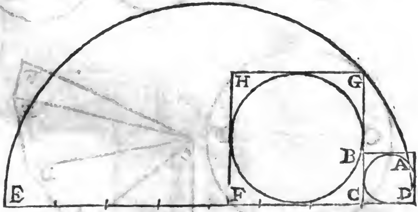
Sit dati circuli diameter A B, quẽ volumus triplare. Elongetur A B in C, & sit A B, æqualis A C, & fiat circulus ex diametro A C, & sit A B æqualis A D, quæ in circulo locetur per primum 4. & ducatur D C, dico circulum ex D C diametro, circuli ex A B triplum esse. Cuius demonstratio pendet ex 12.ª Euclidis. 13. libri. Si vero quintuplare voluerimus. Sit data diameter A B circuli quintuplandi, elongetur quantũ A B, & sit B C, circumducatur ei circulus A D C, in quo pentaganum æquilaterum inscribatur per vndecim 4. & sit linea subtendẽs duobus lateribus D C, pentagoni latus A C, dico quadratum D C, & D E simul iuncta quadrati A B quintupla esse. Demonstrationẽ quære ex secunda 4. Euclidis.



At is modus, vniuersalior, & commodior visus. Sit datus circulus A B dimetiente descriptus, volo tergeminum reddere. Puncto igitur B, ipsius lineæ A B ad rectos angulos adiungatur



tur D B, paris quātitatis. Mox trahatur A D, dein ipsius lineæ D A, in puncto D alia adiūgatur D C, ad rectos angulos, & eiusdem quantitatis A B, & ducatur C A, & dimetiente C A fiat circulus, qui A B circuli tergeninus erit. Quoniam potētia lineæ A C, potentia linearum A D, D C sibi vendicat, & A D ipsas A B, B D, igitur A C valet tres circulos, cuius inest A B. Quod si quintuplare, aut per alios impares numeros multiplicem reddere voluerimus: Addemus puncto C lineam alteram ad pares angulos quantitatis A B, mox trahemus lineam, cui aliam addemus eiusdem quantitatis A B, & erit quintupla ipsius A B.

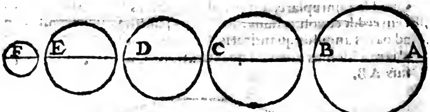


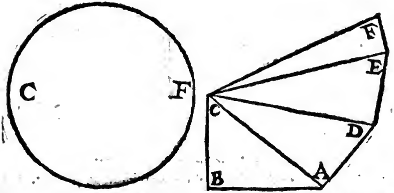
Possumus etiam, si velimus, alio modo idem exquirere. Statuatur circulus A B C D septies multiplicandus, cui circumducatur quadratū, & latus eius prolungabimus, illudq; in octo

 partes

partes diuidemus, cuius principium D, finis E, mox D E per medium diuidatur in F, positoq; pede circini in F, & alio D F, circumducatur, quousq; semicirculum absoluat D C, & latus C B quadrati producatur vltra B in continuum, rectumq;, ad arcum D E, & vbi eum contingit, illic scribe literam G, & ex C G fiat quadratum C G H F, in quo circulus inscribatur, qui continebit septies ipsum B A C D. Quoniã C G est media proportionalis inter E C, C D, igitur per 13. 6. vt E C, prima ad tertiam C D, ita C H quadratum secundæ, ad B D quadratum tertiæ, per 20. 6. Est autem E C per constructionem septupla ipsius C D, igitur quadratum H C septuplum ipsius quadrati B D, quod probandum assumpsimus.

Datis diuersæ quantitatis quamplurimis circulis, vnum formare, cuius circuitus omnium capiat quantitates. Probl. 3.

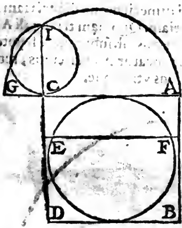




SINT positi quini circuli diuersæ capacitatis A B, BC, CD, D E, E F. quorum quantitates volumus singulari circulo com-

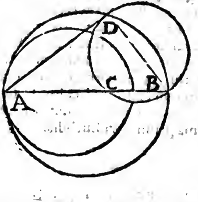
comprehendere quod ita propemodum faciendum existimamus. Esto enim circuli diameter A B, cōstituatur ad rectos angulos ei B C, mox ducatur linea ab A, ad C, & hæc dimetiens potest binos circulos A B, B C. Porrò puncto, A lineæ A C recta linea erigantur ad rectos angulos, quæ sit A D, & à pūcto D trahatur linea D C, & hæc dimetiens est, capiens tres circulos A B, B C, C D. ipsi demum C D recta linea ad rectos erigatur D E, quarti circuli dimetiens. Trahaturq; ex E ad C linea E C, & hæc est dimetiens potens quatuor circulos. Postremo & lineæ E C ad rectos iterum excitetur, quinti circuli E F, trahaturq; per F C dimetiens, capiens iam cunctos circulos. Et hoc modo omnes licet quotquot volueris comprahendere. Demonstratio habetur ex penultima primi libri Euclidis.

Ex dato circulo datam partem subtrahere. *Probl.* 4.

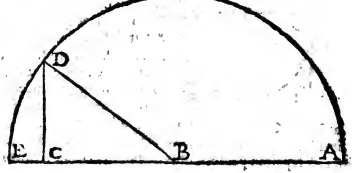


SI dati circuli volumus tertiam, vel quartam partem extrahere, hoc modo facito. Esto circulus A B C D, circa eū describe quadratū A B C D, cuius abscinde partem tertiā, ac transuersa linea conuenit à reliquis distinguere superne. F E. Procurat igitur A C in G, & fiat C G æqualis C E, supra lineam A G dimidium rotunditatis arcū excurrat, & linea D E C eousq; producēda erit, quo circumferentiam in I offendat. Linea C I potest quantum parallelogrammam A C F E, sic circulus I C diameter valet, tertium circuli A B C D. sic de quinta, & septima parte. Cuius demonstratio ex vltima secundi dependet.

Datis duobus circulis inæqualibus, à maiori minorem ſubducere, & circulum dare reliquo æqualem ſpatio. Probl. 5.

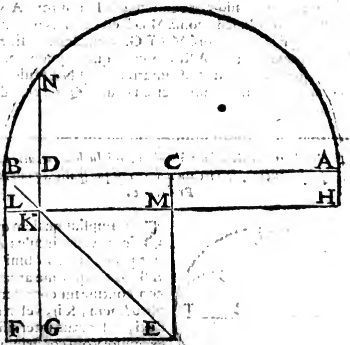


SVbducitur etiam circulus minor à maiori,& circulus etiam formari poteſt,qui vtriuſq; differentiam capiat. Eſto maior circulus A B D, volo ab eo circulũ ſubducere, ac mox alium circulum formare, qui lunulam A B D C, inter vtrũq; relictam capiat. Subducendus circulus A C hęreat in fine diametri A B in A. Poſitoq; circini pede in A, vagum ad circũferentiam traducito,& vbi eã incidit,ibi locetur D.Mox ex D ad B tranſuerſa ducatur linea. dico lineam D B eſſe eius circuli dimetientem,differẽtiam capientem inter A B, A C differentiam. Quoniam trianguli ADB angulus D ad circumferentiam rectus eſt,ſubtenſa A B poteſt, vt A D, D B, ſi igitur ex A B ſubducatur A D circulus, remanet alter D B, differentiam capiens vtriuſque.



Poßumus, & aliter demonſtrare. Extendatur linea A B, cui adiungatur linea B C, & ſit B C, poſitoq; B centro, interuallo A B,

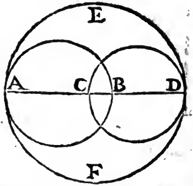
A B, facio semicirculum A D E: tum super C erigo perpendicularem C D, quousq; tangatur circumferentia in puncto D, & B D connecto, dico C D esse quæsiti circuli diametrū. Quoniam C angulus rectus, quadratū subtensæ B D æquale est quadratis B C, C D, & quadratum B D est æquale A B, quia ex centro: ergo quadratum C D, tāto minus est quadrato B D, quantum quadratum B D.



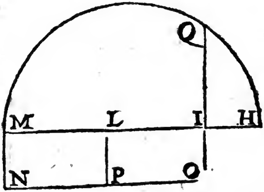
Quod si voles alio modo efficere, hac ratione assequeris. Sit dimetiens maioris circuli C B, & ab ea amputetur dimetiens minoris circuli C D, & linea B C tantundem extendatur ad A, & puncto C facto centro, circumducatur semicirculus A N B, & à puncto D, vbi minor dimetiens maiorem abscindit, erige super transuersam A B ad rectos D N, & vbi D N periferiam secat A N B, istic pone N, & hæc linea erit dimetiens circuli inueniendi, qui differentiam capiet inter maiorem, & minorem cir-

circulum. Ex linea B C describatur quadratum per 46. 1, & sit C E B F, ducaturq; diagonium B E, & per D punctum descendat parallelus ipsi B F, sitq; D G, secabitq; diagonium in K, & per K signum excitetur alter parallelus ad A B, & sit H M K L, & ex A ad H ducatur alter parallelus ipsi C M. Quoniam supplementum C K, supplemento K F per 43. 1. est æquale, addatur commune quadratum D L, erit C L æquale D F, sed quia A M est æqualis M B, quia A C, & C B sunt æquales, ergo A M ipsi D F est qualis, addatur commune C K, erit totũ A K æquale gnomoni M D F. Sed quoniã M D F est excessus maioris quadrati C B E F super minorẽ M K E G, & quadratum lineæ D N est æquale quadrangulo A K, & ex consequenti gnomoni M B F, quæ est differentia vtriusq; quadrati, ergo D N circulus est differentia duorum inæqualium circulorum. Quod erat demonstrandum.

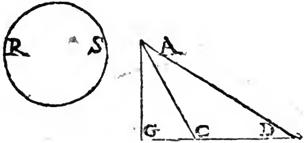
Datis tribus circulis, duos à maiori, qui duobus circulis laxior sit, subducere, & circulum dare reliquo spatio æqualem.
Probl. 6.



SIT amplius qualem quis cõficere velit circulus ADEF, sintq; pro arbitrio bini circuli A B, C D, quorum areæ totam non contineant continentis amplitudinem, & ij, vel in seipsos flexi, vel mutuo intercisi, vt in exemplo: Volo constringi circulum, qui reliquum spatium contineat, scilicet interceptum vacuum. Ex tribus A D, D C, B A fiat triangulum A C D, quod obtusum erit, producaturque alterutrius minoris circulatus, videlicet D C, cousq; sit productionis meta, quousq; à trianguli supercilio, quod prædictæ lineæ incumbit, linea ad perpendiculum descendat, sitq; A G. His perfectis extruetur parallelogramum, cuius productius latus sit ex C D geminata, & sit M L,

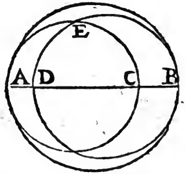


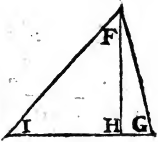
M L, L I breuius ex C G, sitq; M N, I O, & producatur M I, donec æquetur I O, & fit I H, & extrema lineæ ora terminetur per circuitionis arcum M Q H, elongeturque O I, inferaturque coeunti lineæ cum arcu litera Q, sic ex linea I Q,



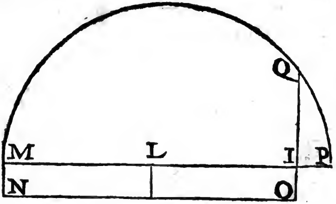
fiat circulus R S capiet iam dictam differentiam. Quoniã angulus A C D est obtusus, quadratum lineæ A D, maioris circuli superat quadrata D C, C A minorum circulorum per rectangulum compræhensum ex D C, & C G bis, per 12. 2. Eucli. Et ex his constitutum rectangulum M I, & diameter Q I capiet compræhensam aream, ex qua circulus R S quæsitam differentiam continebit.

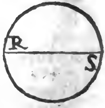
Datis tribus circulis duos à maiori, qui duobus circulis angustior sit, subducere, & circulum dare reliquo spatio deficienti æqualem. Probl. 7.





ESTO AEB circulus, qui capiet duos circulos A C D B, quorum vterq; concauitatem arcus capientis contingat, suisq; areis continentis aream excellant, vestigandus est circulus, qui differentiam excellentis areæ excipiat. Fiat triangulum ex tribus lineis A B, A C, D B, per 22. 1. Eucl. & sit G F I, qui erit acutus: cadat ex apice F trianguli in substratã basem



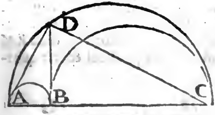


G I orthogonaliter linea F H, & vbi eam abscindit, illic fige literam H. Porrò ex geminata base G I, & linea G H in se ductis, fiat parallelogrammum MO, & superior linea M I procurrat

rat

rat quousque fit æqualis I O, & sit P. mox partire interuallum M P per æqualia in D, & ex D centro describe semicirculum, elongeturq; linea O quousq; attingat arcum M P in Q, & I Q dimetiens erit futuri circuli differentiam capientis. Quoniam quadratum F I minus est F G, G I quadratis tantum, quantum rectangulum bis sumptum ex linea I G, G H per 13. 2. Eucli. quod erit N I, & linea I Q erit dimetiens continens aream N I, circulus igitur R S, ex linea I Q cōstitutus, differentiam capiet, quantam duo illi circuli aream suscipient circuli A E D.

Circulum formare, qui arbilonem capiat duorum circulorum ab altero contentorum, qui duo circuli æquales sint continenti. *Probl.* 8.

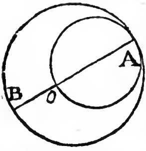


ESTO maior circul° A D C, & sint duo circuli minores A B, B C, quorum arcus in diametro sese inuicem tangant in B, & ex alia parte cōcauitatē maioris circuli A C, volo inuestigare dimetientē circuli, qui aream capiat arbilonis A B C D. Producatur linea ex mutuo circulorum contactu B, donec rotundationis maioris circuli aream tetigerit B D, dico eam esse diametrum futuri circuli, qui arbilonis A B C D aream continet. Hanc cōstructionem demōstratione præsenti rectam suffulciemus. Quoniam linea A C secta est in puncto B, quadratū quod fit ex A C, æquale est quadratis, quæ fiunt ex A B, B C, & parallelogrammo, quod bis fit ex C B, B A, ex imperio 4. secundi Euclidis. Sed parallelogrammum ex C B, B A est æquale quadrato D B, circulus ergo ex D B, est æquale arbiloni A B C D. Quod quadratum ex D B æquale sit quadratis A B, B C. patet etiam ex 17. 6. Eucl. Vel quoniam circulus ex D C æqualis est duobus circulis ex D B, B C, quia B est angulus rectus, & circulus ex D A, circulis ex A B, BD: ergo circulus ex B A est æqualis duobus circulis A B, B C, & duobus circulis ex D C, qui in eo continētur, arbilon igitur ex circulo D B constat.

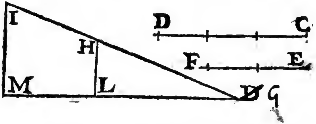
Correlarium.

Ex hoc prouenit correlarium, dato arbilone, posse illico dari circulum ei æquale, scilicet lineam erigendo ad circumferentiam ex coniunctionis puncto.

A dato circulo alium in datam proportionem abscindere.
Probl. 10.



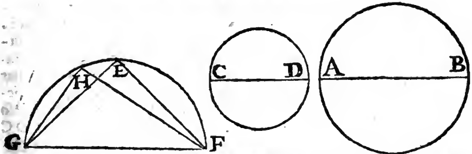
ESTO datus circulus A B, volo aliū construere, vt ad eum datam proportionem habeat. Sitq; data proportio C D ad E F, scilicet sesquialtera, iungantur angulo binæ lineæ, quarum vna G H sit æqualis lineæ CD, protēdaturq; quousque H I sit æqualis E F, mox alteri lineæ æquetur diameter A B, quæ sit G L, iungaturq; H L, & G L extendatur, & à puncto I, lineæ H L parallelus excitetur I M, dico I M diametrum esse quæsiti circuli AO subsesquialteri, & erit quar-



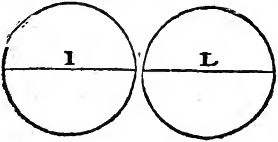
ta linea proportionalis inuenta. Quoniam proportio G H ad H I, est sicut G L ad L M ex 12. sexti Euclid. & G H ad H I, est sesquialtera ergo G L diameter ad A O diametrum sesquialtera est.

Ex duobus inæqualibus circulis duos æquales facere. *Probl.* 11.

SINT duo circuli inæquales A B, C D, volo hos duos circulos inæquales ad duos æquales reducere. A B, D C: coniungo



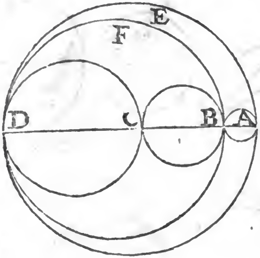
gò ad rectum angulum,& sint G E F, & connecto G F. Tunc super G F facio semicirculum, qui per E rectum angulum transibit: mox diuido circumferentiam in H bifariam, & produco H E



G E, E F, dico duos circulos duarum dimetientum G E, E F, esse æquales duobus dimetientibus G H, H F, & proinde circulis, I, L. Quoniam angulus H est rectus, quia ad circumferentiam, ergo quadrata G H, H F sunt æqualia quadrato G F, & quadratis G E, E F etiam æqualia quadrato G F, & quæ æqualia vni tertio, æqualia inter se, ergo circuli I, L sunt æquales A B, C D. L

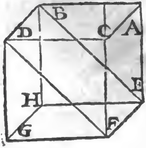
Circulum formare, qui capiat arbilonem trium minorum circulorum ab vno maiori contentorum, qui tres circuli æquales sint diametro continentis. Prop. 9.

ESTO circulus A E D cuius dimetiens A D tribus circuli diametris intercidatur D C, C B, B A, postulamus circulum formare, qui arbilonem, vel interceptam aream à maioris cir-



circuli concauitate, & minorum conuexitate contineat. Ex B D diametro circulus fiat B F D, & per superiorem propositioné arbilon B F D C capiatur, mox lunulæ A D E F B D, quãtitas cognoscatur per octauam, à qua circulus A B subtrahatur per 5. nostram, & sic de cæteris.

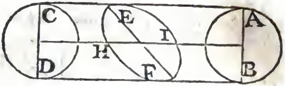
Si solidum cubum, vel parallelipedum altera parte longius obliquè ex oppositis lateribus secetur, sectio altera parte longius erit. Probl. 12.



Esto solidus cubus A B C D E F G H, & secetur à plano B D E F, oblique ex oppositis cubi lateribus B D, C F, dico B D, E F esse altera parte longius. Quia D G, G F æqualis est, D F autem subiacens linea est æqualis duobus quadratis D G, G F, ergo longior B D, quæ ipsi G D æqualis est. Idẽ dicendũ de altera parte B H, H E, quia B E maior est B H, H E igitur B D E F altera parte longior est. Idem quoque dicendum de solido parallelipedo altera parte longiori.

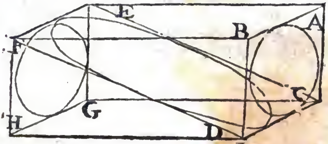
Si cylindrus plano secetur per obliquum, eius sectio oualis erit. Prop. 13.

Sit cylindrus A B C D, & secetur rectè A G B, sectio A G B cir-



circulus erit: si obliquè secetur, vt in I E H F, sectio sphærois erit. Ex ea quæ Serenus probauit in suis cylindricis.

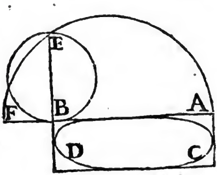
Si intra solidum parallelipedum altera parte longius cylindrus inscribatur, tangens sui circuli basis latera eius quadrati, & parallelipedum solidum obliquè secetur, ea proportio erit circuli quadrato, quàm sphærois figura ad suum altera parte longius. Prop. 14.



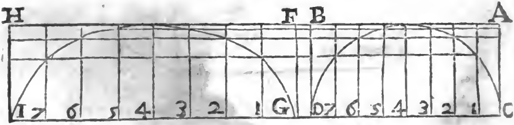
Sit parallelipedum solidum altera parte longius A B C D E F, & sint cylindri in eo descripti, bases A B C D, E F G H, circuli in ea descripti A B C D, E F G H, & planum obliquè secans illud sit C D E F, & sphærois in eo descripta C D E F, dico sphæroidem intra se descriptam eandem habere proportionem ad suam figuram altera parte longiorem, quàm circulus A B C D ad suum quadratum A B C D. Cuius demonstrationẽ omittimus, nam ex his, quæ Euclides in suorum elementorum 12. & Archimedes in 31. propositione descripserunt, demonstratur.

Data

Data sphæroide circulum eiusdem areæ describere. *Probl. 15.*



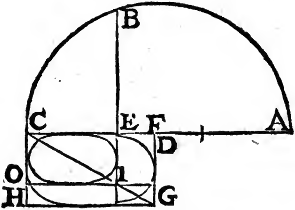
ESTO data sphærois ABCD, iubeo circulum eiusdẽ spatii. Circa datam sphæroidẽ quadrangulum circumscribatur, ABCD, & latus AB prolongetur vsq; ad F, vt BF sit æqualis BD, & circa AF semicirculus describatur, elongeturq; BD, donec circumferentiam feriat, & sit in puncto E, dico circulum circumscriptum circa BE diametrũ continere aream sphæroidis ABCD. Hæc clara sunt ex demonstratione Archimedis libro de sphæroidibus, & conoidibus, parte 5.6.& 7. Sphæroidem describendi modum mechanice, & gratia commoditatis proponam ex Alberto Durerio.



Describe quadrangulum in duplo, triplo, aut sesquialtero, & sit in circulo supra AB, inferne CD, cuius latus CD diuide in puncto E per medium, ac posito vno circini pede in puncto E, interuallo EC, ducatur per superiorem partem vsq; ad D, continget hic arcus lineam AB, deinde partire lineam CD in octo æquales partes, & ex singulis diuisionibus protrahe sursum parallelas in nuper descriptum arcum. Dein fac iuxta quadrangulum ABCD adhuc alium quadrangulum æqualis altitudinis, sed longitudinis quantæ volueris, cuius superior linea FH, inferna verò GI, & seca id quoque in octo partes æquales, vt prius

prius, postea producito ex singulis sectionibus sursum lineas parallelas. Dein ex singulis intersectionibus prioris arcus, quę per octo lineas parallelas factæ sunt, parallelas transuersales per omnes perpendiculares longioris quadranguli, & per sectiones illas longiorem parallelorum arcum produc lineã arcualem de puncto in punctum, incipiendo ab angulo G, & finiendo in I, vt vides.

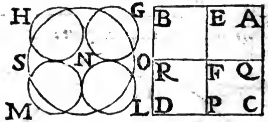
Datam sphæroidem duplare, vel quadruplare. Probl. 16.



SIT duplandum quadrangulum E C I O, quod idem est ac dupplanda sphærois, quæ intra illud circũscripta est, & quadrangulum erit simile, similiterq; positum: quemadmodum & sphærois. Producatur latus quadranguli E C, vsque ad A, & sit A E dupla ipsius E C, ac in ipsius A C medio D, posito circini pede, D A interuallo, describatur circulus A B C, producaturq; I E vsq; ad circumferentiam B, & erit E B latus vnum rectanguli describendi. Rescindatur igitur ex C A linea C F, æquali E B, & ducatur diameter C I, dein per F ducatur parallela ipsi E I, quousque occurrat diametro C I in G, & per G altera parallela ipsi F C producatur, quæ sit G H, compleaturq; parallelogrammum F H, erit igitur hoc parallelogrammum ipsi C I simile, similiterq; positum, & duplum. Quoniam A E, E B, E C sunt tres lineæ proportionales ex 13. sexti, erit vt A E

prima ad E C tertiam, ita parallelogrammũ F H ex E F secunda (nam C F sumpta est æqualis E B) ad parallelogrammũ E O, supra tertiam E C, quod simile, similiterq; descriptum.

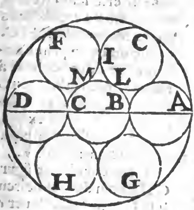
Si circuli diameter bifariam secetur, & ex vna parte circulus fiat, hic erit totius pars quarta. Prop. 17.



RATIONES circulorum sequuntur rationes quadratorũ, eis circumscriptorum, vel inscriptorum, & quemadmodum si quadrati diameter diuidatur, quadratum ex vna parte erit quarta pars totius, ita & circulus. Exemplum. Latus AB, quadrati A D diuidatur bifariam in E, dico quadratum ex A E, quod est A F est A D quadrati pars quarta. Trahatur E P parallela ipsi A C, & Q R ipsi A B, & erunt quatuor parallelogramma rectangula, & si probari potest per 4. 2. rationem reperies apud Platonem in Memnone. Socrates enim puerum hoc modo docet. Sit bipedalis linea A B, dico suum quadratum esse quatuor pedũ. A Q erit vnius pedis, erunt duo quadrata Q F, F R. sit & altera pars C D duos pedes longa, vnum alta C Q, erunt enim duo quadrata C F, F D, tota igitur quatuor erit pedum. Sit ergo circulus O I L M, cubus diameter O N S, diuidatur bifariã in N, ex quantitate O N quatuor circuli inscribantur, dico quatuor hos circulos toti æquales esse. Ratio ex superiori pendet: nam & circuli se habent ad quadrata, vt eorum diametri.

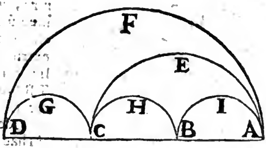
Circulorum vacua metiri, quando maior minores contineat. Prop. 18.

SIT magnus circulus A E F D H G cuius diameter A D diuida-

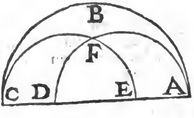


uidatur in tres partes, & in eo fiãt tres circuli A B, B C, C D, & ſupra duo alii, & duo infra inſcribantur: nam ſex circuli æquales intra vnum inſcribuntur ex 15.4. & ex præcedẽti totus circulus nouẽ circulos con tinebit: nam diameter trifariã diuiſa eſt, ſunt intus ſeptẽ contenti, ergo omnia vacua duo erunt circuli, cuius tertia pars erit ſcalprum cum ſuo reſiduo E F I, & I L M,

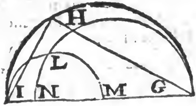
Arbilones per circulares figuras metiri. Prop. 19.



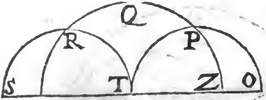
SIT arbilon primum A F D G C H B I A, inueſtigandũ quot circulos capiet, qualis A I B. Ex præcedenti ſemicirculus A F D capiet nouem ſemicirculos, qualis A I B, ſi ſubſtuleris A I B, B H C, C G D erit arbilon reliquum ſex ſemicirculorũ. Si quærimus arbilonem A E C H B I, erit ſemicirculus A E C quatuor ſemicirculorum qualis A I B, demptis duabus A I B, B H C, erit arbilon duorum ſemicirculorum. Si quærimus arbilonem A F D G C E A erit ex iam dictis quatuor ſemicirculorum.



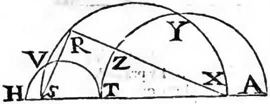
At ſi erit ſemicirculus maior A B C, capiēs duos ſemicirculos A E D, E F C, vt docuimus in prima noſtri, & ſint intus contenti à maiori, dico arbilonem A B C F A eſſe æqualē duplato E F D, quod ex figura patet; nam quod replicatur in figura E F D, deficit arbilon in ſua figura A B C F.



Idem eueniet in figura G H I: nam duo ſemicirculi G H I, & M L E I per 6. noſtri, capiunt aream continentis circuli G N I, vnde duplatum M L N eſt æquale arbiloni G H I L G.



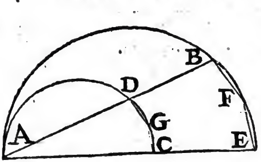
Poteſt etiā euenire, vt arbilon mediū P Q R T P eſt ęquale duobus extrinſecis circuli partibus O P Z; T R S, ex ſuperiori ratione.



Idem eueniet in hac poſtrema, vt arbilon Y Z T V R Y ſit æquale duob⁹ circuli extrinſecis partibus A Y X V S H.

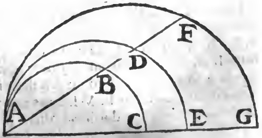
Si duo vel quamplures circuli in fine diametri ſe tangunt, & à contactus puncto ducatur linea eos ſecans, arcus ſecti inter ſe ſimiles erunt. Prop. 20.

SINT duo circuli A B E, A D C ſe mutuo tangentes in fine dia-



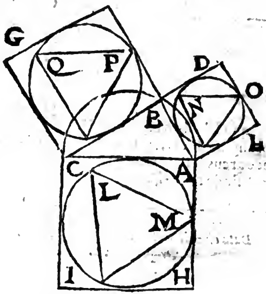
diametri A, ducatur recta A D B secans arcus D C in G, & B E in F, dico arcus DG, GC, B F, F E similes esse. Quoniam duo anguli D A C, & D G C duobus angulis B A E, & BFE æquales sunt, quod duobus rectis æquales sint, & ex 22.3. ablato communi angulo B A C, erunt reliqui D G C, B F E æquales, & proinde arcus B E, D C sunt similes ex similium arcuum definitione, & sic de reliquis.

Data circuli portione eam multiplicare.
Prop. 21.



SIT data circuli portio A B, quam volo duplare, & sit eius circulus A B C, & sit semicirculus A D E duplus dati, per primam nostri, & linea A B trahatur longius in D, & si voluerimus quadruplare, sit circulus A F G quadruplus, & linea A D in F extendatur: dico portionem D A ipsius B A duplam, & F A ipsius B A quadruplam, cuius ratio patet ex anteriori.

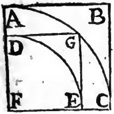
Ex duabus portionibus similibus vnam similem facere, vel subtrahere. Prop. 22.



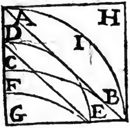
SINT duæ inæquales circuli portiones P Q, O N, sed similes nam vnaquæq; est tertia circuli pars. Perficiantur circuli per 25. 3. Eucl. & sint P G Q, O N B, circa quos describantur quadrata B G, E B, vel eorum diametri, & iungantur ad rectum angulum A B C, & secundum A B describatur quadratum, & in eo circulus M L I, & sit M L latus æquilateris trianguli. Portio M L, erit æqualis duobus iā dictis portionibus. Vel si ex M L portione voluerimus portionem P Q subtrahere, erecto quadrato A C, ac supra A C semicirculo descripto, ponatur latus quadrati B C, & eius latus B A latus quadrati portionem similem continentis. Et sic possumus ex pluribus portionibus vnam facere, & omnia illa quæ de integro circulo retulimus.

Datum semicuruilineum triangulum duplare, subducere, vel è duobus similibus vnum facere. Prop. 23.

SIT semicuruilineum triangulum D G E, quod volo duplare,



re, & ſit circuli quarta pars F D E, fiat etiã circuli dupli pars, & ſit A G C, circa eam quartam etiam quadrati partẽ circumſcribo A B C F, dico triangulum ſemicuruilineam A B C G duplũ eſſe D G E. Quia quadratum A B C F duplum eſt D G F E, inſcripta portio proportionalis erit, & ſic ſubtrahere; & ex multis vnam facere poterimus ex ſupradictis. Eodem modo triangulum D E F duplare poterimus quod eſt æquale iam dicto: nam quadrati dimidiũ B H A eſt æquale B A G, ſi dematur portio B I A, æqualis B C G, remanet triangulum B A C æquale B H A iam dicto. Vnde ſi voluerimus prædictum E D F ſemicuruilineum triangulum duplare duplato quadrante H A B G, protractoq; diametro B A, circulus duplus B I A, qui erit B C deſcribatur B C, & erit triangulum A B C duplum triangulis E D F.



IO·BAPTISTAE PORTAE NEAPOLITANI, ELEMENTORVM CVRVILINEORVM.

Liber Secundus.

AXIOMATA.

1

SI eidem addideris, quod prius dempseris, quantitas æqualis erit.

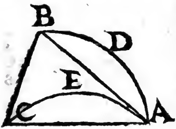
2

Si nota quantitas à nota subtrahatur, quod remanet notum erit.

Triangulum semicuruilineum ex æqualibus iisdemq; circumferentijs compositum quadrare. Prop. 1.

ESTO triangulum quodpiam semicuruilineum A D B C E, æqualibus nimirum, iisdemq; circũferentiis A D B, A E C, & recta B C basi constitutum, volo illud quadrare. Ducatur linea A B, & A C aio aream trianguli semicuruilinei A D B

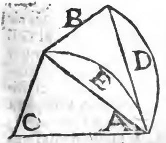
CE



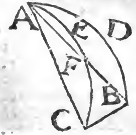
C E esse æqualem triangulo rectilineo A B C. Quoniam circumferentia A D B, est eodē,& ęqualis AEC, portio A D B est æqualis portioni A E C, ablata A D B, repositaq; in A E C æquale remanet triangulum rectilineum A B C, semicuruilineo D primum axioma.

Vel fiat triangulum æquale rectilineum A B C, & sit A F C, ex 22. 1. Euclidis, ergo semicuruilineum triangulum A D B C E est æquale triangulo semicuruilineo A E C F, dempta communi portione A E C, remanet rectilineum A F C, triangulo semicuruilineo æquale A D B C E.

Alter casus.

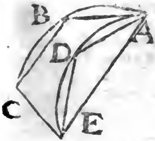


At si triangulū A D B C E angustius erit, & portionis lineæ neutiquam intactas circumferentias relinquent, sed per medium transibūt, eadem operatione idem assequi poterimus. Sed quo res dilucidior euadet, rem exemplo cōpletemur. Esto triangulum A D B C E, & circumferentia A D B æqualis sit A E C, trahanturq; rectæ lineæ A B, A C, & secet A B circumferentiam A E C, aio rectilineum A B C æqualē semicuruilineo ADBCE.



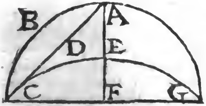
Quoniam portio ADB, æqualis est AEC, dempta communi A E F remanet A D B F E æqualis A F C,apponatur vtriq; areola F B C, erit A B C rectilineum triangulum semicuruilineo triangulo proposito A D B C E æquale.

Vel ad eadem præstanda, possumus easdem circumferentias in plures partes diuidere, nempe binas, ternas, q:a-



ternas, vt A C circumferentiam in A B, B C, & A E in A D, D E. Vnde exclusæ partes A B, B C, inclusis A D, D E, erit area rectilinea A B C E D A, æqualis semicuruilineo A B C E D A.

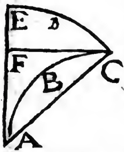
Triangulum semicuruilineum ex varijs circumferentijs compositum, quarum altera alterius dupla sit, quadrare.
Prop. 2.



ESTO triangulum semicuruilineũ A B C D E, cuius circumferentia E D C sit circuli dupli ipsius A B C, sed E D C sic octana pars circumferentiæ sui circuli G E D C, circuli verò A B C quarta, aio triangulum semicuruilineum A B C D E rectilineo inuestigari posse parem. Rem ita moliemur. Completa circumferentia C E, & sit C E G, & cõiugatur A C, mox portionem C E G, diuidatur per medium, & sit diuisionis linea E F. dico triangulum A F C semicuruilineo triangulo parem esse. Quoniam tota portio A B C, æqualis est dimidiæ E C F, id propterea dempta A B C portione, & reposita E F C, semicuruilineum A B C E abiit in triangulum rectilineum A C F.

At si circulares lineæ magis cohærebunt, vt circumferentiarum bases introrsum sesecent, eadem erit operatio, & demonstratio, vt in prima propositione. Productis lineis portionis A C, & semiportionis E F C, triangulum rectilineũ A E F C, semicuruilineo par erit. Quoniam spatia ipsa portionum A B C, & E F C æqualia sunt, ablata interiacen-

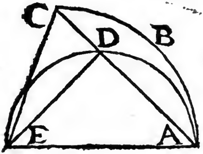
iacente portione D C, quod reliquum est A B C D, ipsi E D C F æquale erit, addita vtriq; areola A E D, erit totum triangulũ rectilineum A E F C, toti semicuruilineo A B C D E æquale, nam quanta pars ex demptione abiit, tanta ex repositione substituta est.



Vel potest & transpositis lineis alio modo triangulum semicuruilineum cõstitui. Sit circumferentia dupli C D E retro, C B A ante, tunc ex puncto C, super basim A E cadat ꝑpendicularis C F & connectetur C A, & sic triangulum semicuruilineũ A B C D E rectilineo F C A parem iri. Ratio in superiori.

At si, vt diximus, ex variis, & inæqualibus circumferentiis orbiculata triangula composita erunt, tunc mente concipiendum, si circulus duplus alteri sit, subdupli duæ circumferentiæ partes vni dupli respondent, si quadrupli quatuor, & sic deinceps. Esto, verbigratia, circuli dupli circumferentia E D C, & sit octaua suæ circumferẽtiæ pars, respondet duobus octauis subdupli circuli A B C. Diuidatur ambiens linea A B C bifariam in B, & trahatur A B, B C, & E C, erunt duæ A B, B C portiones vni E C æquales: sic vna E D C, duas illas A B, B C absumet. Vnde si triangulum semicuruilineum, duabus octauis circumferẽtiæ partibus decrescimus A B, B C: augemus vna E D C, & sic par pari referemus.

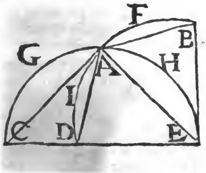
Alter casus.



Potest & aliter euenire. Sit triangulum semicuruilineũ A B C D E, & sit A B C quarta dupli circuli, & A D E semicirculus subdupli, docebimus quomodo possis rectilineum triangulum æquale semicuruilineo facere. Trahatur ex puncto

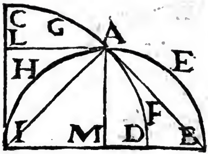
A per medium A D E vſque ad C, & linea D E: Erit triangulum ſemicuruilineum A B C D E æquale rectilineo D C E. Quoniã portio A B C eſt dupla ipſius A D per 20. primi noſtri, & huic nempe portioni A D, æqualis D E: dematur dimidia portio A B C D, addatur D E compar, remaneatq; communis areola D C E F vtriq;. Sic enim rectilineum triangulum D C E æquale ſemicuruilineo A B C D E ſic exceſſus vnius alterius defectu rependetur. Sic & in aliis notis circumferentiis, quadruplis, quintuplis eodem methodo vti poteris.

Semicuruilinea triangula ad verticem conſtituta, ex eiſdem, & æqualibus circumferentijs conſtituta, vel ex æqualibus nota quadrare. Prop. 3.



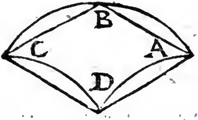
SI duo ſemicirculoſa triangula ad verticẽ conſtituta ex eiſdem, & æqualibus circumferẽtiis fuerint, ductis à vertice ad baſes rectis lineis, erunt rectãgula circuloſis æqualia. Si primam huius libri leges, non ſecus eſſe inuenies, quàm diximus. Si acciderit, vt circumferentiæ eædem ad verticem ſint inæquales, ſed in id conueniãt oportet, vt dextra interior ſiniſtræ exteriori æqualis ſit. Sint inæqualia triangula ſe inuicem decuſſantia B A E, A C D ſegmenta ſint æqualia, vt B F A, A I D, & E H A, A G C. Tũc protractis rectis B A, A D, A E, A C triangula rectilinea B A E, A D C erunt circuloſis æqualia: B F A H E, A G C D I A. Quoniam ſegmẽtum B F A, æquale eſt A I D. Si B F A ſeorſum expellimus, ac A I D ſua vice complectemur: ſic etiam reiicimus A G C, reponimus E H A.

At ſi fuerint duo ſemicuruilinea triangula B E A F D, & & A C G I H cõſtituta ad verticem A ex inæqualibus circumferentiis notis, quarum D A C ſit circulus duplus ipſius B A I. Tra-



Trahãtur duæ lineæ perpẽdiculares ex A ad C I. & ſit A L, & A M. ad B I, & binæ aliæ rectæ B A, A I, dico rectilinea triangula A L I, A B M ſimul iũcta æqualia eſſe ſemicuruilineis BEAFD, C G A H I Quoniã periferia D A C eſt circuli dupli quarta, & B A I ſubduplus ſemicirculus, duæ ſemiportiones A F D M, A G C L abſumẽt duas portiones B E A, A H I, demptis igitur B E A, A G C L, repoſitisq; A H I, A F D M rectilinea triangula B A M, L A I æquiualebunt ſemicuruilineis iam dictis.

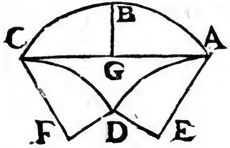
Curuilinea triangula ex eiſdem ex æqualibus circumferentijs, & ex varijs notis. Prop. 4.



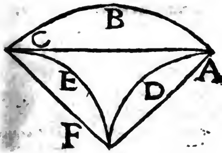
ESTO curuilineum triangulum ex tribus circũferẽtiis A B C, C D, D A, eiuſdem curuis, ſed ABC dupla AD, D C conſtitutum, quod quadrare intẽdimus, dico protractis æqualibus ſubtenſis A B, B C, C D, D A, quadrilaterum rectilineum A B C D eſſe æquale curuilineo A B C D. Quoniam demendo portiones A B, B C, addendoq; A D, D C, quæ ſimul æqualia ſunt, voti compos fies, nil aliud dicimus.

Poterimus alio modo id aſſequi. Protrahatur linea A C, & binas A E, E D, & lineas C F, F D, vt ſemiportio A E D, ſit æqualis A B G, & D E F, ipſi B G C, nam duæ portiones dimidiatæ A D E, C D F, æquiualent vni integræ A B C, vna hac dempta, his additis, quod diximus eueniet.

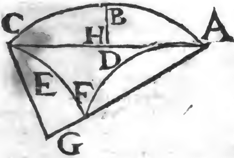
Eo-



Eodem modo curuilinea triangula ex inæqualibus circumferentiis, ſed altera alterius, exempli cauſa, ſit dupla. Sit curuilineum triangulum A B C E F D ex inæqualibus circumferentiis, ſed A B C dupla ſit A D F, & F E C, ſubtenſis lineis A C, A F, F E, erit quadratum, nempè binæ portiones A D F,

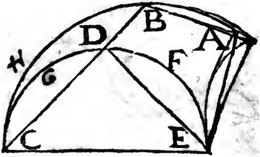


E F C æquipollent ſimplici A B G, vnde illa dempta, his additis, triangulum rectilineum F A C, æquipollet curuilineo iam propoſito.



Poteſt contingere, vt triangulum cōſtituatur ex variis circumferētiis, & inæqualibus, vt F E C, ſit dimidia ipſius A B C, & ipſa ABC dupla ipſius ADF,

A D F, sic facta semiportione G F G, æquali B H G, & subtensa A F portio A D F, erit æqualis A B H, vnde hac dempta, illis subditis, triangulum rectilineum A C G erit æquale curuilineo A B G E F D. Alter casus.

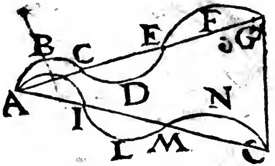


Esto curuilineum triangulum A B G D F E propositũ quadrandum, & circumferentia circuli A B G sit dupla E F D G C diuidatur circumferentia E D C bifariam in D, & trahatur C D B, erit ceratoide triangulũ B H C G D æquale portioni D G C p 20. primi nostri. Vnde dempto B H G C D reponaťeius viceportio E F D æqualis D G C. Et q̃a circũferentia A E est æqualis, & eadẽ ipsius A B ablata A B, reposita A E trapezium rectilineũ ABDE erit æquale ꝓposito rectilineo triãgulo ABHCGDFE.

Cyssoide tirangulum ex æqualibus, & inæqualibus circumferentijs quadrare. Prop. 5.

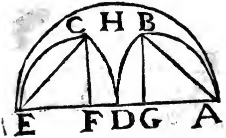
Esto cyssoide triangulum A C E ex tribus inæqualibus cir-

circumferentiis constitutum' A B C, C D E, E F A, curuilineum, at latera diuisa, & æqualibus circumferentiis constituta, vt A B sit æqualis B C, & C D ipsi D E, & E F ipsi F A, vnde tractis lineis rectis A C, C E, E A, & demptis tribus circumferentiis B C, D E, F A, & aliis tribus repositis A B, D C, E F, rectilineum triangulum A C E, æquale est cyssoidi ABCDEF.



Sit quoq; semicyssoide triangulum quadrandum A B C D E F G H I K L M N O ex variis circulorum circumferentiis, sed tamen binis semper oppositis æqualibus constitutum. Videlicet G F E maioris circuli circumferentia, quam E D C, & E D C maior C B A. Sed tamen G F E æqualis O N M, & E D C, I L M, & C B A, A H I. Si à puncto A ad basim G O lineæ recte trahantur, totum assequeris, ratio pendet ex superiori.

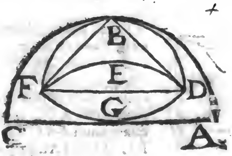
Arbilonem quadrare. *Prop.* 6.



Esto arbilon A H E C D B quadrandum, quia portio A H, est

est dupla A B, & A B est æqualis semiportioni B G D, ergo ablata A B H, & reposita B G D, & ablata itẽ H C E, reposita DEF, rectilineum G B H G F est æquale iam dicto arbiloni.

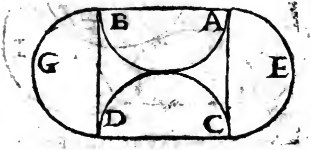
Potest, & alio modo probari. Semicirculus A B C est duplus semicirculi D B F, ergo vacuum A B D F B C G est æquale se-



micirculo, dematur ex vtroq; portio D E F, D G F, ergo lunula D B F E est æqualis arbiloni A B D G F B C, sed arbilon est æquale triangulo rectilineo D B F, ergo arbilon dictum triangulo D B F est æquale.

Quadratum curuilineum quadrare. Prop. 8.

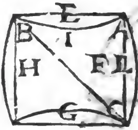
ESTO quadratum curuilineum A F B G D F C E trahantur quatuor lineæ ex angulis A B, B D, D C,



F CA,

C A, dico quadratum rectilineum A B C D curuilineo iam dicto prestabit. Quoniam sunt quatuor semicirculi æquales inuicem, tollantur A E C, B G D, reponantur A F B, C F D, sic rectilineum curuilineo æquale erit.

Alter casus.

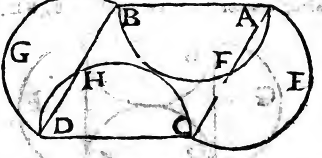


Potest, & quadratum aliter fieri ex quatuor etiam rectis angulis, vt diximus A B C D. Quoniam portiones æquales sunt, & ex æqualibus circulis ablatis portionib' A I B, C H D, repositisq; A I C, B G D, rectilineū quadratum A B C D, curuilineo A L B G D H C I A æquipollebit.

Corolarium.

Hinc patere potest quadratum curuilineum ex aduersis, & conuersis circumferentiis cōstitutum recta diameter bifariam secat, latus A B, lateri A C æquale est, & basis etiam B C communis vtiq;, ergo triangulum C A D, triangulo B D C æquale erit, igitur bifariam secat.

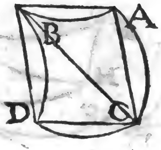
Rhombum curuilineum quadrare. *Prop. 9.*



ET Rhombus curuilineus A F B G D H C E quadrabitur ductis ex angulis rectis lineis A B, B D, D C, C A, nam demptis

ptis ſemicirculis A E C, D B G, repoſitisq; A F B, CHD, demptisq; portionibus H D A F rectilineum rhombum curuilineo æquabitur.

Alter caſus.

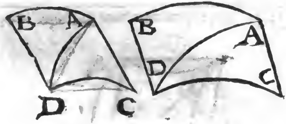


Poteſt eſſe rhombus alio modo ex æqualibus circumferentiis A B, B D, D C, C A. Et quoniã portiones æquales ſunt, duabus demptis A C, C D, totidem repoſitis A B, BD, erit rectilineo æqualis.

Corolarium.

Eiuſmodi etiam rhombos recta dimetiẽs æqualiter ſecàbit: nam hinc inde duo æqualia triangula conſtituent.

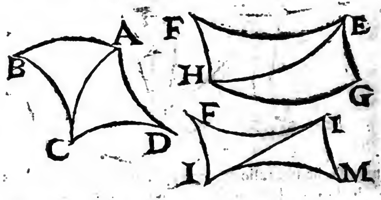
Rhombos, ſeu rhomboides ſemicuruilineos quadrare. *Prop.* 10.



Semicuruilineus rhombus, & rhomboides facilius quadràbitur: nam portione vna dempta, & repoſita, æquales erunt curuilinei, rectilineis.

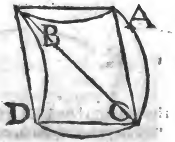
Corollarium.

Sed in istis, qui ex isoscelibus triangulis semicuruilineis constituuntur, curua diameter circumferentiæ æqualis, & eos bifariam secabit, nam in duo æqualia isoscelia triangula diuidun ur semicuruilinea, vt A B D, A D C.



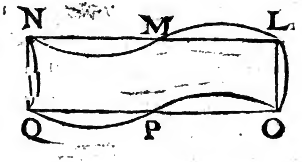
Possumus & alio modo rhombos, & rhomboides ex isoscelibus triangulis constitutos ex tribus cōuersis, & vna auersa diametro per mediam diuidere, vt in rhombo A B C D. rhomboide E F G H, cum diameter A C, E H eos bifariam dimidiat in duo isoscelia æqualia A B C, A C D, & E H G, E H F, & in rhōboide, ex quatuor conuersis constituto diameter recta etiam I L, in duo semitriangula æqualia diuidit, ex oppositis angulis ducta.

Altera parte curuilinea, & semicuruilinea quadrare. Prop. 11.



Al-

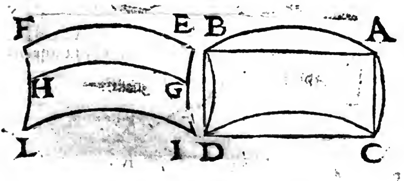
Altera parte longiora quadrabis omnia, vt quadrata, duobus ſemper portionibus oppoſitis ablatis, & repoſitis, vt in A B C D.



Erit altera ſpeties altera parte lõgioris curuilinei L N O Q demptis ſcilicet tribus portionibus L M, P Q. E L repoſitis M N, O P, N Q quadrabitur.

Corollarium.

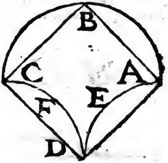
At reliquas ſpecies diuides non dimetiẽte ex angulo ad an-



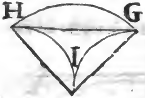
gulum ductã, ſed per medium vtrinque latera parallela, vt in E F I L, dimetiens G H.

Peleces quadrare. *Prop.* 12.

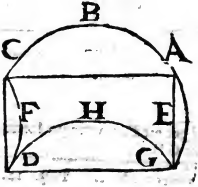
POSSVNT peleces multifariam variare ex variis circulorum circumferentiis, & primo ex paribus, cuius pars circum-



cumferentiæ dimidij circuli A B C, aliæ duæ partes ex duabus quartis eiusdem circuli A E D, D F C, vt demptis illis, his repositis, rectilineum quadratum peleci æquale erit.



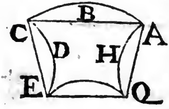
Potest, & ex duplis circumferentiis constitui, vt sit G H quarta dupli, duæ verò quartæ subdupli G I, I H, quæ additæ rependent ablatum G H, eodem modo ex quadrupla eueniet. Pelecis ex inæqualibus, sed eisdem circumferentijs, & variis, vt pelecis G E A B C F D H quadranda portio A B C, sit æqualis



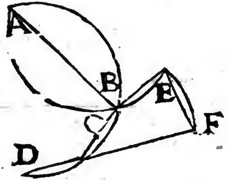
G H D, & D F C, G E A, demantur A B C, A E G, reponantur G H D, D F C, & erit quadrilaterum rectilineum, A C G D æquale supradictæ peleci.

Tra-

Trapezia curuilinea ex æqualibus, & inæqualibus circumferentijs constituta quadrare. Prop. 13.



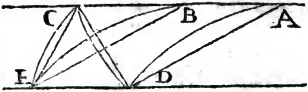
SIT trapezia curuilinea ex quatuor, vel pluribus circumferentiis constituta, vel omnibus inæqualibus, vel tribus, aut duobus, dummodo inter eas ita cõueniant, vt tres duæ, aut plures possint quantũ vna, aut aliæ. Nunc sit portio A B C tripla, & sint tres æquales AHG, G F E, E D C, dematur maior, addantur tres minimæ, & coæquabitur rectilineum curuilineo.



At si trapezium figuratum fuerit, vt iisdem circumferentiis, & æqualibus constituatur, sed crus alterum altero longius sit, & quantum in altero deficit, in altero superfit, minus addatur superfluo, & fiat æqua cõpensatio. A B duæ portiones demantur, addantur duobus aliis B C, C D, & quia pars E F superabit, deficit verò E B, huic addatur illius vice, sic rectilineum B E F D C B curuilineo æquabitur.

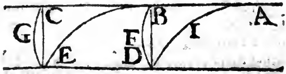
Triangulum isoscele semicuruilineum, & parallelogrammum semicuruilineum in eadem basi constituta, & eisdem parallelis, parallelogrammum triangulum duplum erit, & rectilineis æqualia erunt. Prop. 14.

Sit



SIT triangulum isoscele semicuruilineum D C E, & parallelogrammum semicuruilineum A B D E, in eisdem parallelis A C, D E: dico parallelogrammum in eadem basi, & eisdem circumferentiis constitutum, esse triangulo duplũ. Quoniam portio D C: ipsi D E æqualis, dematur E C, addatur D C, erit triangulum rectilineum D C E curuilineo æquale. Et quia portio A D ipsi B E æqualis, dematur B E, addatur D A, erit rectilineum parallelogrammum A B D E semicuruilineo ęquale. Sed rectilineum A B D E triangulo D C E duplum est, quia in eadem basi, & eisdẽ parallelis constituta per 41. primi Euclidis: ergo parallelogrammum rectilineum curuilineo triãgulo duplum.

Parallelogramma semicuruilinea in eadem basi, & æquidistantibus circumferentijs constituta, & inter parallelas, æqualia sunt. Prop. 15.



SINT duo parallelogramma B F D C G E, & A I D B H E, in eadem basi D E, & in eisdem parallelis rectis A C, D E, constituta, dico inuicem esse æqualia. Trahantur rectæ A D, D B, B E, E C. Quia portio B F D est æqualis C G E, dematur C G E, reponatur B F D, rectangulum parallelogrammũ curuilineo æquale. Idem dicendum de altero parallelogrammo

A I D B N E, curuilineo, æquale est rectilineo A D B E, & quia parallelogramma rectilinea in eadem basi, & eisdem parallelis constituta, ad inuicem sunt æqualia, per 36. pri. Eucl. &c. Idem & de parallelogrammis curuilineis dicendum.

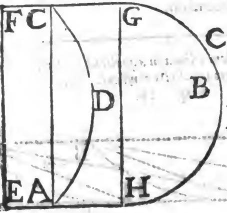
Parallelogramma curuilinea, & semicuruilinea in æqualibus basibus, & eisdem circumferentijs, & eisdem parallelis constituta, inuicem sunt æqualia. Prop. 16.

SINT duo parallelogramma semicuruilinea, ex æquidistantibus circumferentijs A H, B G, & C F, D E, & æqualibus basibus constituta. F E, G H, in eisdem parallelis A D, H E. dico esse inuicem æqualia. Trahantur rectæ A H, B G, C F, D E, A F, B E. Quia A H portio æqualis est B G, dempta A H, reposita B G, erit rectilineum A H B G, curuilineo æquale, & idem de alio C F D E. Sed rectilineum A H B G, curuilineo æquale, & idem de alio C F D E. Sed rectilineum C D F E in eadem basi cum rectilineo A B F E, & A B F E, in eadem cum AHBG, ergo inuicem æqualia per 26. primi Euclidis, ergo &c.

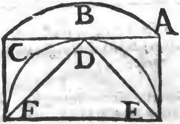
Parallelogramma semicuruilinea in eisdem parallelis constituta, & ex diuersis circumferentijs, videlicet duplis, dari possunt rectilineis æqualia. Prop. 17.

PARALLELOGRAMMVM ex diuersis circumferentijs, videlicet duplis: vt in parallelogrammo F G B H E D, circumferentia A B C, dupla ipsius H B G, in eisdem parallelis GF, HE, erit rectilineo G F H E æquale. Exponatur quadrans circuli dupli, & sit G A D C, cuius latera A G, G E, secentur bifariam

in H, & I, & per H, & I, diameter circoli subdupli adigatur, vt



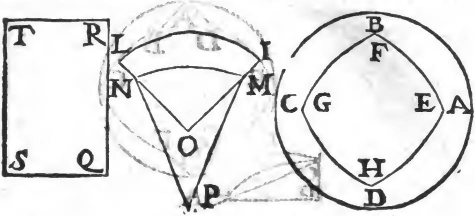
centrum sit punctum K, & sit semicirculus E B F, & trahatur A E, C F, dico semicuruilineam figuram E A D C E, esse æqualem quadranti E B F. Quia quadrans G A D F, est æquale semicirculo E B F, & linea A H, ipsi H G æqualis; & E H, H K, & angulus E H A, G H K æquales, quia adinuicem, ergo triangulũ A E H, ipsi G H K æquale, ergo figura E A D C F, æquale est semicirculo. Sed in parallelogrammo semirectilineo C G B H A D, semicirculus H B G, est æquale figulæ E A D C F. Si dematur semicirculus H B G, & reponatur eadem figura, rectilineum G F H E, æquale est parallelogrãmo iã memorato curuilineo.



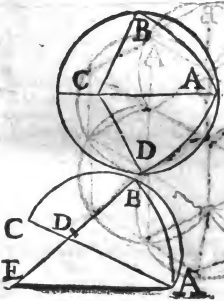
Vel si foris constituta fuerit dupli portio, dematur ea, quæ est A B C D, reponatur in semicirculo EDF, portiones subdupli ED, DF, sic rectilineum E D F C B A, erit ciruilineo æquale. Præterea quia semicirculus E B F, est æqualis figuræ E A D C F, ergo lunula YBZ, extrinseca est ęqualis duobus triãgulis, E A Y, F Z C, intrinsecis.

Cor

Coronas quadrate. *Prop.* 18.



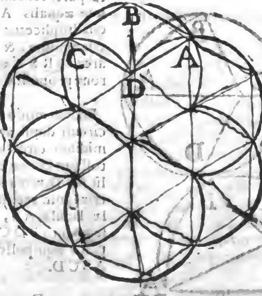
SIT quadranda corona A B C D E F G H, pono eius quadrantē I L O, & ibi comparem octauam partem circuli dupli M N P. Tollatur commune M N O, remanet cuspidalem triangulum quadrilaterum M O N P, æquale quartæ parti coronæ I M L N, quæ æqualis A B E F, quadruplicetur cuſpidale triangulum, & erit ipſius area Q R S T, æqualis coronæ propoſitæ.



Eodem modo pars ABE, circuli dupli, abſumit dimidium circulum A B C, tollatur comune triangulũ A B D, remanet A D E, triāgulũ rectilineũ æqualæ lunulæ A B, & circuli ſegmento B D C, quo duplato æquipollet coronæ A B C D.

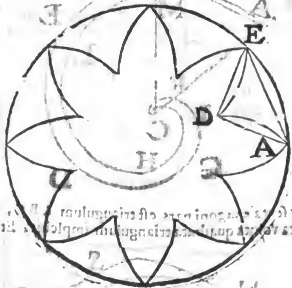
 Sic

Sic portio A D C B, æquipollet dimidiæ duplæ B C D. Tollatur commune B C. remanet triangulum B C D, æquipollens femilunulæ A B C D. Sic quatuor triangula B C D, absumunt coronam C B A D E F G H.



Alter casus.

Per quartam nostri secundi quadratur triangulum curvilineum A B C D, per rectilineum quadrangulum A B C D. sex igitur eiusmodi quadrangula rotam coronam absorbent.



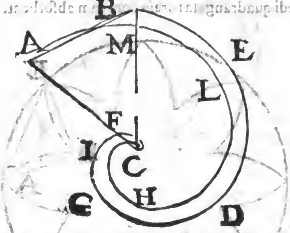
Eodem modo alia coronæ species quadratur, & sit eius pars A E D, cuius maior circulus A E, sit duplus A D, & sit A D, octaua pars sui circuli, & A E, sui circuli, duę igitur portiones A D, D E, æquipollent vni maiori. Octo igitur eiusmodi triangula respondent propositæ coronæ.

Voluntas omnifarias quadrate. Prop. 19.

PROPOSITVM sit quadrate volutam A D E F G C H I L M B, scio hanc volutam sextam esse partem volutæ circuli, N O P Q R S, & omnes circuli volutæ non capiunt nisi exago-

ni

ni aream, ergo vnaquæque sextam partem complectitur. Vna igitur volutæ pars A D E G F C H I L M B, est sexta circuli

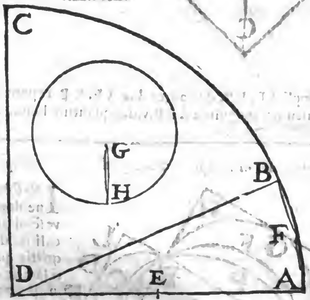


pars, & sexta exagoni pars est triangulum A B C, ergo tota proposita voluta quadrata triangulum implebit. Et possumus

hoc modo cyſſoidem triangulum, melius quàm in quinta propoſitione, & quæ videntur irregularia omnia quadrare.

Circuli quadrationi approximare. Prop. 20.

SIT circuli quadrans A C D ſexto decuplus circuli G H: nam, diameter parui circuli eſt quarta pars A E, diametri A D, & triangulum ergo A B D, eſt quarta pars quadrantis A C D, ergo æqualis circulo. Circumferentia A B, biſariam ſecetur in F, & producantur rectæ A F, B F, tollantur è circulo

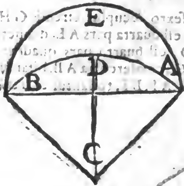


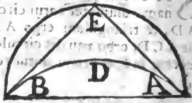
G H, duæ portiones A F, F B, & ſint G H, totus ergo paruus circulus dempta portione G H, eſt ęqualis quadrangulo A F B D.

Lunulam in dupla portione quadrare. Prop. 21.

SIT quadrans circuli dupli A D B C, & ſit ſemicirculus ſubduplus A E B, tollatur communis portio A D B, remanet

triangulum rectilineũ A B C, quód est æquale lunulæ A E B D; Quia portio A D B, est circuli dupli, valet duas portiones circu-





li subdupli A E, E B, demantur duæ A E, E B, reponatur A D B, rectilineum triangulum A E B, valet quantum lunula A E B D.

Sublunulas in data proportione quadrare. *Prop.* 22.

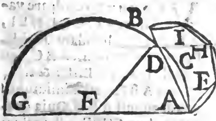
IN sola portione dupli accidit, vt semidiameter circuli subdupli sit æqualis quartæ parti lateris dupli, ideo in illis perfectæ lunulæ, in alijs verò semilunulæ verius dici possunt. Vt gratia exempli, sit semicirculus A C B G, circuli A E B, quadruplus, & quarta pars semicirculi A C D G,

A C D G, ſit A D, diameter ſubquadrupli circuli. ADB, tranſeat per punctum D, dico curuilineum triangulum A C D F,

æquale ſemicirculo A E B. Tollatur communis portio A C B, remanet rectilineum triangulum. A D F, æquale ſemilunulæ A E B D C A.

Alio modo.

Quia portio A C D, quarta pars circuli A D G, eſt quadrupla portionis A E, ſemicirculi A E H I B, ſubquadrupli, ergo



in quatuor partes diuiſa portio A C D. valet quatuor illa A E, E H, H I, I B. Demãtur illæ quatuor, addatur illa A C D, rectilineum A E H I B A, valet quantum triangulum reſiduum A D F, ſic etiam de triplis, quincuplis, & cæteris.

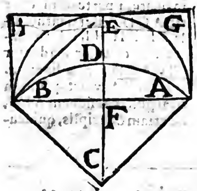
Sublunulas in data proportione quadrare. *Prop.* 23.

SIT ſemicirculus A D G, quadruplus ipſius A E B, vt ſuperius, & ipſius A E B, capiatur duplus, & ſit circumferentia A C B, remaneat infra ſublunula A C B D I A, quam volumus quadrare. Quia ſemilunula A E B D I A, non eſt,& nota etiam lunula A E B C, ex vigeſima noſtri huius, ſi notum à noto ſubtrahatur, quod reliquam eſt notum erit.

Poſſumus etiam proximè prædicto modo quadrare, quia portio A D, eſt dupla ipſius A G B, diuidatur A C D, in duas partes

A C, C B, Demantur hæ duæ portiones AC, CB, reponatur A D rectilineum A C B D A, est æquale sublunulæ A C B D I A.

Vacua rectilinea circa quadrabiles figuras curuilineas quadrare.
Prop. 24.



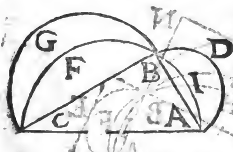
VOLUMUS quadrare vacuum A G E L, E N B L, A D B, circa lunulam AEBD. Quia triangulum A B C, est æquale lunulæ AEBD, & triangulum A B C, est dimidium quadranguli A B G. Quia quadrangulum EHBF, est duplum triangulum B F C, quia triangula E H B, B F D, sunt æqualia B F C, ergo quadrangulum E N F B, est æquale triangulo A B C, dematur lunula AEBD, quæ est æqualis triangulo AB C, ergo vacuum remanens A G E L, E H B D, A D B, est æquale triangulo A B C, rectilineo.

Vel volumus quadrare vacua H A E, E B I, H C O, O I D, Ex quadrangulo ABCD, tollatur pelecis HEIGOFH, quæ nota est, quod remanet, vacui quantitas est.

Duas

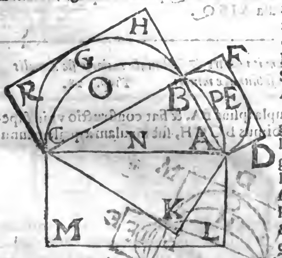
Duas lunulas inæquales in circulo se secantes, quadrare.
Prop, 25.

SINT duæ lunulæ inæquales A D B I, B G C F, in quocunq; circulo A B F C, dico illas quadrabiles esse, & æquales, triangulo rectilineo A B C. Quia A B C, est rectus angulus in semicirculo, semicirculi A D B, B G E, æquales sunt semicirculo A B F C, collãtur communes portiones A I B, B F C, reliquæ duæ lunæ A D B I, B G C F, reliquo triangulo rectilineo A B C, æquales sunt.



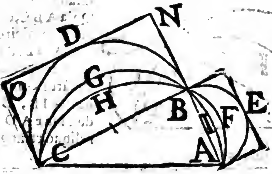
Vacua circa lunulas quadrate. *Prop.* 26.

EX linea B C, & circa semicirculum D C G, describatur quadrangulum & circum circulum A E B, sic ex linea A C, & semidiametro A N, & fit A M. Volumus vacua A D E F B, & B G H C G, quadrare. Sit quoq; triangulum A C H, æquale A B C. Quoniam quadrangulum A C L M, æquale est duobus quadrãgulis A D F B, B H K C, & lunulę B G C O, B E A P, sunt ęquales triangulo A B C, ex superiori, & triangulum A B C, est æquale A H C, ergo vacuum A L M C H A, est æquale vacuis iam dictis.



Vacuum circa lunulas & sublunulas quadrare. *Prop.* 27.

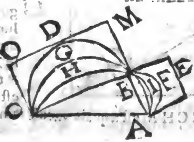
TRIANGVLVM A Q C, vt superius vidimus est æquale duobus lunulis A G C F, & A D B I, vacuum lunularum



duplarum A D B I, B G C P. est æquale vacuo A I N, N C M, remanet vacuum inter eos A N C Q quod est æquale sublunulæ B F C P, dempta lunula A I B Q.

Sublunulam maiorem ita secare, & sublunula maioris sic æqualis lunulæ, vt sublunulæ minori. *Prop.* 28.

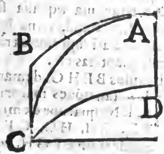
SIT linea B C, dupla ipsius BA, & fiat constructio vt in superiori, demonstrabimus B G C H, sublunulam æqualem lunu-



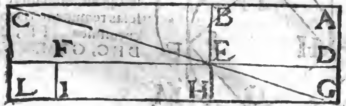
læ A E B I. Quia altitudo A B, est æqualis altitudini B N, & B E, est dupla B N, ergo triangulum A B C, est dimidium quadranguli B N D C, & quia lunula B D G H, est æqualis dimidio quadrangulo, ergo est æqualis triangulo A B C. Sed æquales triangulo A B C, sunt duæ lunulæ B D C G, & A E B I, ergo sublunula B G C H, est æqualis lunulæ A E B I.

Triangulum semicuruilineum ex quarta semicirculi subdupli, & octaua dupli quadrare. Prop. 29.

SIT oblatum triangulum ex octaua A B, circuli dupli, & quarta subdupli A C, volo illud quadrare. Ex A C, quarta semicirculi fiat lunula, & sit A C D, lunula A D C nota est ex vigesima huius, parallelo grauinum A B D C, inter duas parallelas A D B C, positum, eisdem circumferentijs etiam notum est.



Modum, quo notum rectilineum à noto rectilineo subtrahatur inferius apponemus. Sit parallelogrammi quantitas A B D E, circa crucem B H, D F



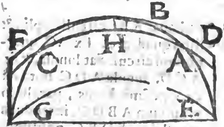
constituta ad rectos angulos, & sit quantitas lunulæ ex alia crucis parte H I E F, elongetur parallela I H, quousque coeat cum linea A D, in G, & per G E, trahatur linea quousq; coeat cum A B, & sit in C, & à C parallelo trahatur E H, quousque coeat cum G H I, in L, dico parallelogramum F L, esse quan-

titatem

titatem trianguli A B C. Quia lunula A D C, ſuperatur à parallelogrammo A B D C. Quoniam A B D E ſupplementum eſt æquale E L ſupplementum, & lunula eſt pars ſupplementi E I, ergo F L, eſt reliquum, quod querimus.

Alteram lunulæ ſpetiem quadrare. Prop. 30.

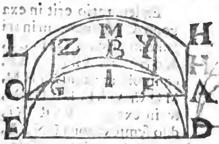
SIT lunula A B C, volumus eam quadrare. In ſuperiori propoſitione cognouimus quantitatem E D B, quadrabilem, vidimus etiam in ſeſtadecima huius noſtri ſemicurvilineum triangulum A H B, eſſe æqualem D A C. Vnde hæc duo triangula æqualia ſunt D E B, triangula, vna lunula dimidiari ſuperioris triangulí quantitas eſt.



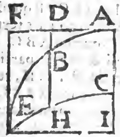
Sit circulus duplus A C M N, ſubduplus B E H G, demantur duæ portiones maioris M A, E N, quatuor ex minori T E, E H, H G, G F, erit quadratum E F G H, æquale N A M I S, uacuum A C, I L, notum eſt, quia parallelogrammum inter parallelas remanent triangula curuilinea I F E, E L D, D H C, G B M.

Quomodo lunulæ cornicula quadrari poſſint. Prop. 31.

FIAT ſemicirculus D F B G E, & ſit ei compar ſuperior figura D A F I G E, trahatur A C, & in eius medio N, fiat compar



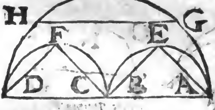
compar circulus A Y M Z C, & puncto M, linea semilis & parallela A F I G, quæ sit H M L, & puncto F D, trahantur parallelæ A H, L C, ipsæ F Y Z G, dico posse quadrari cornicula A Y F, G Z C. Quoniam parallelogrãmum rectilineam A H L C, notum est ex secunda huius, notum est quoque parallalegrammum F G Y Z B, à quo dematur, nota est quoque lunula F B G I, à quibus dematur, item etiam duo triangula per vigesimumoctauũ A H M, M L C, remanet duo cornicula A Y F, Z G C, quadrabilia.



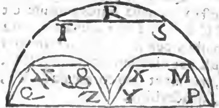
Cognita parte B G E, cognoscitur & reliqua A B C G, circumducatur quadrangulum, & ducatur linea D H, per B G, dematur B G C, scitur vacuum D F H E, dematur A F C G, remanet alterum vacuum A B D, C G I H.

Trapezia multa curuilinea quadrare. Prop. 32.

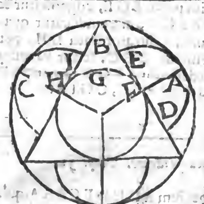
POSSVMVS quadrare trapezium A G H D F C B E A, quia semicirculus A G H D, est quadruplus A E B, per decimum septimũ primi nostri, duo semicirculi A E B, C F D, valent quantum arbilon A G H D C B A, dematur portio G H, quarta circulis pars, & duæ portiones A E, B E, & duæ aliæ C F, E D, remanet duo triangula rectilinea A E B, C F D, æqualia curuilineo trapezio iam dicto.



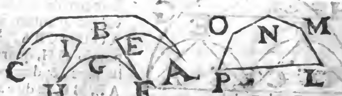
Eadem



Eadem ratio erit in exagono & trigono, nam in trigono in circulo G H I L F, duo trigona A B C, D E F, equipollent vacuis G H M, M O C, O L F, HILONM, & in exagono P S R T Q, duo semiexagona P N X Y, & Z & R Q, valet vacuum P S T Q Y Z, in linea H L, tangens circunferentiã circulorum est latus trigoni æquilateri per 12. 13. Eucl.



Circulus A B C, est quadruplus D A E, ergo pars tertia circuli A B C, quæ est A B C, est vnius circuli & tertiæ partis, pars eius tertia est F G H, reliquum ergo erit corona A B C H G F, demantur duo quadrantes circuli A E F, C H I, remanet vacuum AEFGHICBA, quantitatis dimidij circuli, & quia octaua pars circuli maioris, valent quatuor, quare minoris; dematur portio B, ex maiori, & 4. 8. ex minori L M, M N, N O, O P, ergo rectilineum L M N O P, valet trapezium A E F G N I G B A.



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